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AUTHOR Zerbinos, Eugenia
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ABSTRACT

Since videotex and teletext information retrieval systems are likely to become as widespread as television, their impact--personal, social, physical or psychological--should be examined before widespread implementation to insure "the greatest good for the greatest number." Transmitted by television signal, teletext information will probably be used for home retrieval of news, while videotex, a two-way interactive system connecting users with databases via the telephone network, could be used to pay bills, to bank, and to shop. The institutional impact of these systems will be greatest on news-based industries; paper mills, newspapers, magazines, and the postal service will suffer severe recessions. Shifts from heavy to information or service industries will cause severe industrial unemployment unless workers are retrained for new, information-based jobs. Benefits for society and the individual include a cleaner environment as transportation needs decline and greater individual control over information received. With databases taking over mundane chores, people will have more time for creative activities. Unfortunately, only upscale consumers will be able to enjoy these advantages. Even these benefits, though, could pose problems. With more couples working at home, family problems as well as family closeness, could increase. (MM)

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A QUALITY OF LIFE APPROACH TO ASSESSING VIDEOTEX IN THE NEW AGE*

By

Eugenia Zerbinos
College of Journalism
Marquette University
Milwaukee, Wisconsin 53233

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The United States has entered a new age, one in which we "mass-produce information the way we used to mass-produce cars."[1] This mass-production of information has been made possible by a concurrent revolution in communication and computer technologies. New communication systems formed by a merger of telecommunication and computer technologies have capabilities far greater than their parent technologies. Systems such as videotex and teletext make it possible to instantaneously transmit vast amounts of information into the home, bringing society far closer to the "impossible ideal" of "all information in all places at all times."[2]

Dizard asserts that these new technologies are capable of expanding "democratic humanistic options, allowing more sharing of responsibilities and rewards."[3] Whether they will do so remains to be seen. Thus far, altruism and concern for the public interest are not the forces shaping the development of these technologies. Instead, the overriding concerns have been: "Which technical standard should be adopted?" or "How much profit can be made and how soon?" Some social forecasters and technology assessors have speculated about the social impact of these technologies. Mostly, they have raised questions without attempting to provide answers: "Will these technologies widen the gap between the 'knows' and 'know-nots'?" Or, they have posed what Mosco calls the non-scenario--"When asked what the growth in communications technology has in store for us, the non-scenario answers: 'It may be good, or it may be bad.'"[4]

Attempts at forecasting, of course, involve a good bit of speculation that relies heavily on the forecaster's inspiration, intuition and imagination. Some of these forecasts may prove to be wrong as one can surmise by looking at the early forecasts about the telephone, for example.[5] Nevertheless, examining the possible consequences of a technology before its widespread adoption can

perhaps help to determine how it might be used to provide the "greatest good for the greatest number." As the various options are explored, one must also consider the wide spectrum of human goals and value systems that exist in the real world. Society is not homogeneous; it is made up of many different sectors, and each should be considered when the social impact of a technology is assessed.

This paper is a beginning attempt to assess the social impact of videotex and teletext. The impact areas will be analyzed within the framework of a categorization scheme that takes into account individual and group goals (or personal and social) and material and spiritual goals (or physical and psychological).[6] The scheme was developed by a physical scientist who recognizes the need for assessing the social impact of technologies and who is also aware of the shortcomings of traditional methods of this relatively new field. As the Organization for Economic Cooperation and Development has noted:

> The approach in many technology assessments is to isolate the major difficulties raised by the technology and to describe in broad outline some of their first-order consequences without trying to determine their extent and relative importance. Only a few studies are conducted as a systematic search for all discernible implications of a given technology and no attempt is made to evaluate the expected advantages and disadvantages in terms sufficiently meaningful and operational to be of use to decision-makers.[7]

Although the scheme used here was originally expressed in mathematical terms, the inadequacy of a purely quantitative approach was addressed by its developer:

> Ideally a methodology will furnish a complete quantitative account of the impact of every proposed technological undertaking on the quality of life for a society. Rarely would such an effort be justified even if it could be carried out....As in other disciplines, some of the most valuable results of a fundamental theory are qualitative.[8]

Hence, this study will approach the problem qualitatively, rather than quantitatively. It is, however, not meant to be an exhaustive treatment of the topic

but is merely a foundation for further work in this area. Following the procedure established in other technology assessments, this paper includes a brief overview of the technology, some state-of-society assumptions, and identification of some impact areas.

The Technology

This section is a brief overview of the technical aspects that are most pertinent to this study. Other sources[9] should be consulted for a comprehensive description of the technologies.

Teletext information is digital data that is transmitted with the television signal on the unused lines of the vertical blanking interval (VBI) scan lines that do not contain picture information. A special decoder attached to or built into a television set extracts the data signals and holds the information in memory. "Pages," or screenfuls of information, are transferred to the TV screen via an electronic character generator. The length of time taken for the information to appear on the screen depends on several factors. These include the number of pages in the cycles, the rate of transmission, the number of VBI lines used for the information, the amount of memory in the decoder, and the importance of the information. Popular pages are sometimes duplicated in the cycle to cut down on the waiting time.

A variety of communications networks can be used to transmit teletext. In addition to VBI transmission, it is possible to transmit on a full channel (broadband), on a portion of FM frequencies, via multipoint distribution systems (MDS), and via cable. Two to four lines of the VBI allows for about 80 to 150 pages in a cycle. Broadband teletext would allow transmission of about 10,000 pages.

Videotex is a two-way interactive system in which users are connected to a computer database by the public telephone network. One is able to receive

information and also to send messages to the computer, to the database, or to another terminal. In operation, a videotex user makes a call to a data bank. Coded signals come back through the line, and a modem converts the phone analog signals into digital form (and vice versa). Less time is required to access videotex than teletext pages because the information is not transmitted in cycles.

A problem with videotex is that it ties up the phone lines, but AT&T is working on a system that will allow simultaneous use of videotex on one telephone extension and incoming calls on the others.[10] Two factors could inhibit development of phone videotex. Widespread adoption would strain the phone network's current capacity, and the expected substantial rise in local telephone rates would deter customers. Also, party-line customers cannot legally use the system, which makes it inadequate in some rural areas.[11] Two-way cable videotex would allow a much greater capacity of information, but only about three percent of American homes have access to two-way cable. An alternative approach would combine the phone and one-way cable systems.

In almost all teletext trials in the United States, the dominant service has been news, weather, and sports information, and, in some experiments, advertising. Videotex, however, can be used for information retrieval, transactions, messages, computing, and telemonitoring. Information retrieval, transactions, and messages are likely to be the dominant future applications. The quantity of videotex information is limited only by the capacity of the host computer database. With computer gateways to other databases, the amount of information that would be accessible by a videotex consumer seems unlimited. Transaction services would allow people to bank, shop, and make reservations from their homes. Because of the potential savings in electronic banking, several banks have already initiated videotex services that offer home banking.

Several factors will influence the success of any videotex or teletext service. Content will be important as will convenience, ease of use, reliability, and cost. Cost will be more of a factor in adoption for home use than it will be in the business environment, because businesses are accustomed to paying for information. How much it costs the consumer for the necessary hardware will depend on which videotex and teletext standards are adopted. Alternatives are the British Prestel, Canadian Telidon, French Antiope, and AT&T Presentation Level Protocol (PLP). The American National Standards Institute and the Canadian Standards Association have proposed the PLP as a common North American standard. CBS, NBC, and Time Video Information Services have adopted PLP technology for their teletext services. Keycom Electronic Publishing will use British technology in its teletext service.[12]

Differences in the systems arise from the method used to construct displays. Prestel and Antiope are character-generation systems. Graphics are constructed alphamosaically, resulting in patterns formed from a series of stepped squares. This is a simpler and less expensive method than the Telidon and PLP bit-map storage systems. The latter method allows construction of an infinite range of character shapes and diagrams. Pictures are constructed using the alpha-geometric approach, which results in smoother lines and more elaborate images than do the other systems.[13] The decoder needed for Telidon is more than twice as expensive as that needed for the British system. Other hardware costs include a modem and an alphanumeric keyboard for videotex, and a numeric keypad for teletext.

State-of-Society Assumptions

There are those who would argue that there is no market for videotex and teletext[14] and, therefore, no need to be concerned about the impact on society. The average consumer, however, is overwhelmed by information abundance and there is a need to bring some order to this near chaos. As Smith notes, "the pursuit

of information 'abundance'...is in reality the pursuit of a manageable modicum of relevant information."[15] Computerization of text will enable consumers to have better ordered and more appropriately selected text. The methods by which consumers have access to such text in their homes may vary. Home information systems of the future may include other technologies such as online databases, computer time-sharing, hybrid services that combine the telephone with cable television, and stand-alone services such as home computers and videodiscs.[16] The differences between these technologies lie in the cost, convenience, ease of use, and utility for the consumer. Many of the applications to which these new technologies can be put are similar.

Campbell and Thomas cite several factors that will encourage entry of videotex and teletext technology into the home market. One factor is the decreasing cost of computer electronics.[17] In 1955 hardware costs dominated software costs 7 to 1, but by 1985 software costs are expected to dominate hardware 9 to 1.[18] The costs of computer memory and processing are falling at a rate of about 15 percent per year.[19] The greatest initial cost to the consumer will be that of the terminals needed to receive and decode videotex and teletext signals. Terminals are expected to substantially decrease in cost when they are mass-produced.

The level of personal income will also determine which technology and how much of it individuals will be able to afford. Even with a continued and increasing proliferation of two-paycheck families, each new technology will be competing for the consumer dollar. Few consumers will be likely to afford all of the available technologies. Consumers will be choosing from an array of home computers, videocassette recorders, widescreen television, videodiscs, cable television, pay cable services, and, of course, videotex and teletext.

Economic and educational policies of the next few years will also influence the development and adoption of new information technologies. As society continues its transition from being industrial based to being information based, great numbers of workers will need to be retrained for jobs in the information sector that uses computer-based technology. As people become more familiar with these technologies in the workplace, they will be more inclined to adopt them for home use. The extent to which they are adopted in society relates to the extent to which national policy and major decision making utilize a computer-based information-processing network.[20]

Perhaps of most importance is the perception of how these technologies can improve one's life, and how they will affect personal freedom, satisfaction, achievement, and privacy. There are those who may resist technological advance and wish to limit it if they perceive the technology to be threatening to their privacy and security, or as encouraging isolation and dehumanization. The popularity of video games is likely to continue to stimulate interest in computer-based technologies, particularly among the younger generation. Youngsters are readily accepting computers and other new technologies; some of them prefer spending summers at computer camps rather than at traditional camps.

Communications policies adopted in the next two decades will also be critical in the development of these technologies. Communications policy in the United States has been based on three ideals: that communications be controlled by the private sector; that communication channels be affordable, widely available, and used in ways that serve the public interest; and that competition be encouraged, with particular emphasis on diversity in the sources of information[21] (the marketplace-of-ideas concept). Because the distinctions between print and other forms of communication are being erased by technology, the regulatory picture is fuzzy.

Relevant Impact Areas

As noted, there are a number of applications that can be made of videotex and teletext. The most probable application for teletext is retrieval of news, weather, and sports information, and classified ads--everything that a daily newspaper now provides, but more quickly. Videotex is likely to be used for information retrieval, paying bills and other banking, writing and sending a letter, making an airline reservation and paying for it, shopping from a catalog, and more. These applications are not the only ones, but they certainly will have a direct or indirect impact in several areas.

Institutional--Perhaps the biggest initial impact will be experienced by paper-based industries and the paper industry itself. The latter has already been battered by the recession. Increasing use of personal computers and electronic word processing are affecting profits and sales, and will continue to do so. It is becoming cheaper to handle words electronically than to handle them physically. In the next two years it is expected that home information technologies will also cut into the demand for newsprint.[22]

The newspaper industry will be affected in several ways. Newspapers could lose almost one third of their advertising revenue to videotex.[23] Videotex is appealing as an advertising medium because it is cheaper--there are no paper, printing, and handling costs--and because advertisers can reach potential customers at the moment that they are thinking about buying a product.[24]

Newspapers and magazines will also be affected by the impact on another paper-based institution--the U.S. Postal Service. About 80 percent of all first-class mail could be handled electronically and at considerably lower cost.[25] Much of the first-class mail that is likely to be adapted to electronic delivery consists of bills being delivered or being paid. Some 40 billion checks are written every year in the United States. As the banking industry moves toward a universal electronic funds-transfer system, the need for most paper transactions

is eliminated.[26] Obviously, electronic mail is not suited to most parcel post, but as other mail is diverted to electronic transmission, the post office will have increasing difficulty meeting its expenses. Postal rates would increase, which could place an additional burden on newspapers and magazines.[27]

On the positive side, the barriers to entry into the world of electronic publishing will be lower than into traditional publishing. With a small capital investment--about $20,000--anyone could become a publisher. With an information-provider terminal, an individual would have access "to everyone in the world with a telephone."[28] In addition, journalists could conceivably by-pass newspapers and sell their ideas directly to the reader.[29] One journalist is already on-line with his column, selling it through a computer time-sharing service (though not yet making a profit).[30] News agencies could by-pass editors and sell their news directly to the public, as the wire services are now doing.

Libraries are certain to be affected by the new technology. Their role as a community resource might increase. Librarians involved in a field test of the British Prestel system believed that the videotex system would draw more people to the library, and would also offer information in a novel manner that might appeal to those who are not inclined to read books.[31] But in a trial by the Online Computer Library Center in Columbus, Ohio, those Channel 2000 users who were most interested in purchasing videotex services were already heavy library users. Users said they were most willing to pay for a video encyclopedia and a video card catalog of library holdings.[32]

Much information now available in print at no cost, however, may be available in the future only through databases. For example, it might be possible to make all publicly accessible federal information available in databases,[33] although it would probably not be free. The depository library system is supposed to provide free access to public information, but these libraries do not always receive complete inventories of government documents. Sometimes they

cannot afford the prices charged for some information made available only through the National Technical Information Service, which was established in 1970 to make scientific and technical information available at commercial prices.[34] A recent technology report from the American Society of Newspaper Editors also suggested that newspaper publishers are beginning to think of their morgues as marketable assets.

Local governments are expected to take advantage of two-way videotex to assess public opinion on community issues. Bell envisions "a complete plebiscitarian system whereby referenda on a large variety of issues could be taken through responses back from computer terminals in each house."[35] A videotex terminal can be used in this way. Besides, as Neustadt suggests, "If people are willing to trust their banking to electronics, voting should be an easy step."[36] Electronic lobbying and polling by candidates and those already in office would also be likely. At least one congressman, James Coyne, already receives messages in his electronic mailbox from constituents who have their own computers.[37]

Other institutions that could be affected by electronic home information systems include retail stores and direct mail-order companies. Airlines could by-pass travel agents.[38] Buyers and sellers of real estate could by-pass real estate agents. Unions are also likely to feel an impact. It is not clear whether the creation and transmission of electronic pages will be handled by journalists, printers, broadcast technicians, or some new category of labor.[39] Badzik also suggests that there might be less need for some physical facilities in education.[40]

Economics--The major impact in this area will be on information as an economic good, and on patterns of employment.

Increasing use of databases will have an impact on information as an economic good because, as Thompson notes, "an information marketplace, where

ethereal products are exchanged for some form of compensation, would seem to be an essential component of an information society."[41] The mass media behave as a public economic good. When one tunes into a television program, others may also tune in without diminishing the available supply. Once a program is on the air, it costs no more for additional viewers to watch it. Whereas teletext behaves more as a public economic good, videotex has the ability to handle information that behaves as a private economic good in a massive way.[42] There will be much less "free" information. As Schiller notes, we have already moved away from free information. "Privatization and commercialization of information now have become the distinguishing practices of domestic information exchange."[43]

Shifts in employment are certain to occur. This shift from an industry-based society to an information- and service-based society has already had a severe impact on employment in the industrial sector. Displacement of workers will continue as more factories and related firms close. Electronic mail will reduce the need for letter carriers, but the impact on current postal employees might not be drastic since half of the postal workers now employed would be of retirement age before electronic mail is in widespread use.[44] Banking electronically will reduce the need for bank tellers, and, because the demand for paper would likewise be reduced, paper-industry employees and employees of check-printing firms, for example, would find themselves looking for work. Similarly, if more shopping is done from home, there will be less need for retail clerks. Transportation workers may be affected as more people bank, shop, and work from home, placing less demand on public transportation. Also, fewer families will need two cars (although they may still want them).

On the plus side, new jobs will be created. There are already more jobs in the information sector than there are people with the skills to do them. Information-assembly firms require videotex editors, graphics artists, data-base

managers, and system engineers. Of course, workers displaced in other areas of the workforce will require job retraining to fill these new positions.[45]

Demography--Although the entire nation is becoming urbanized in the psychological sense, the population is becoming more dispersed geographically.[46] There has already been considerable shifting from the cities back to rural America. If people are able to work and shop from home, there will be even less need to be located near centers of commerce. People will probably continue to use shopping centers as a form of socializing and recreation, therefore shopping center patterns are not likely to experience great change.

Environment--Communications are not dependent on scarce natural resources. In fact, the entire U.S. phone system is powered for a year on the energy content carried by one oil tanker.[47] As more people shop, bank, and retrieve information from home, there will be reduced use of automobiles and public transportation, resulting in a substantial saving in energy. The fewer the cars and buses on the road, the less air pollution. Less traffic will also reduce noise pollution, particularly in urban areas. More trees will be conserved as a result of less reliance on paper.

Values and Goals--The impact of technologies on values and goals is a critical area of concern because of its potential impact on society as a whole. Impact areas include personal freedom, personal achievement, privacy, personalization (or depersonalization), and the marketplace of ideas--one of the most important precepts alleged to operate in a democratic society.

The mass media as we know them today are sender-oriented, permitting little talking back. Teletext will function in much the same ways, except that consumers will be able to filter and choose from the available information, thus giving them control over the information. This individualization will enable people to step out of the homogenized audiences of newspapers, radios, and television, and take a more active role in the process by which knowledge and entertainment

are transmitted. Market forces will control the kinds of information and services that videotex will supply as sovereignty over text moves from the supplier of information to the controller of the technology. "This change in the locus of sovereignty...is the key to the nature of the information society...."[48] As Dizard also notes, new technologies like videotex will lead to a "new kind of First Amendment democracy--every person his own data collector and publisher, unmediated by any authority, public or private, as long as he pays the telephone/computer service bill at the end of the month."[49]

Instant access to information, goods, and services will allow consumers to reduce their interpersonal contact in some areas, but will not necessarily lead to social isolation. Few people really enjoy making a trip to the bank or the grocery store. The time saved by electronic banking and shopping will allow more time for other activities that are likely to involve friends and family. A study of persons 25 to 49 years of age found "a widespread underlying concern about social isolation, rejection and happiness." People have a strong desire for human contact, and technologies that enhance direct communication between people are likely to have a bright future.[50] That contact may not be at the grocery store, but it will still exist. Employees of one company that experimented with home worksites found that the "human need for interplay with co-workers produced an underground, computer-based gossip."[51] In fact, a Delphi assessment concluded that "the interactive nature of videotex could...bring people together electronically who would otherwise never interact."[52] An extreme example of this, perhaps, was recently reported in the media. A man in New York and a woman in Illinois were married following a courtship that began on their computer screens. Both subscribed to a computer time-sharing service. Although this marriage may be an example of an isolated phenomenon, the interchange that now goes on between home-computer users is not. Many users in different parts of the country "converse" on their terminals. Computer

conversations will not keep people from interacting face to face. As Naisbitt has observed, the more "high-tech" that society becomes, the more "high-touch" the members seek.[53] Religious programming on television, for example, has not kept people from going to their places of worship. They go not only to pray but also to be with other people.

Protection of personal privacy is a recurring theme in interchanges about new communication technologies. The concern is that personal information will be available in databases. But much of the information about individuals is already easily obtained in other ways. In today's information society, it is impossible to avoid relationships with record-keeping organizations. An individual would have to forego credit, insurance, employment, medical care, education, and many government services to avoid records.[59] Many people have experienced receiving an unsolicited credit card because they have a good credit rating. An individual's age appears on voting, medical, and insurance records, to name a few. And who has not received dozens of mail-order catalogs and other advertisements related to personal interests and hobbies? Electronic funds transfer could be used to construct a comprehensive record of an individual's travels and habits. The same dossier can be compiled on an individual with an American Express or Visa credit card. All this is not to diminish the importance of personal privacy. "The mere act of obtaining or disclosing information, regardless of its subsequent use, can have an adverse impact upon an individual's sense of trust, security, and well being."

Videotex can enhance personal freedom and achievement in a number of ways. If mundane chores such as banking and grocery shopping can be handled more efficiently, people will have more time to devote to creative endeavors. The opportunity to work at home will enable more of the elderly and disabled in society to be productive. As noted in an earlier part of this paper, the barriers to entry into the electronic publishing business are considerably

lower than entry into conventional media. Videotex will expand the opportunities for more voices in the marketplace of ideas. Because of the technological limitations of the medium, teletext is not likely to allow opportunities for many. Thus far, it seems that the large media conglomerates will exercise control over teletext information.

Social Factors--Four key impact areas have been identified by Tydeman et al.: home and family life, the consumer marketplace, the business office, and the political arena.[56] Within the context of these broad areas are factors such as changes in social status, changes in socialization patterns, family patterns, training of children, education, work habits, use of leisure time, health and safety, inequalities and fractionalization of the audience.

Tydeman et al. predict that work, school, and community gatherings will all be done in the home. Women can have traditional careers and rear children at the same time, or both parents can be part-time workers and part-time parents. The extended family might be recreated. The researchers also suggest that spouses might be drawn to each other as much for their ability to manipulate databases as for their ability to prepare gourmet meals.[57]

Badzik notes that banking and shopping at home would mean that families would spend less time on the road shopping. They "could conduct personal business in the privacy of their homes, feel safer, and live more comfortably and economically." He also suggests that parents with preschoolers could work at home.[58] Anyone who has been the parent of a preschooler, however, can probably imagine how much work could be accomplished under those circumstances.

There is probably a trade-off between working at home and going to the office. In one experiment, sociologists observed that wives of men who were working at home threatened divorce. It seems that their husbands were spending what was formerly "home and family" time as "work" time.[59] In addition, even

the most loving of families would find it trying to have that much togetherness and it would likely lead to conflict in the home.

Some school teachers are demonstrating that children who previously were slow learners or disinterested in school are making remarkable progress when computers are used to aid instruction. Developmentally disabled adults are also able to learn things they previously were thought to be incapable of learning. Videotex could provide similar opportunities for learning in the home. Non-readers and non-library-goers might be encouraged to read text on their television screens, and, perhaps, increase their level of literacy.

Videotex also offers those who are homebound a direct access to information. The social and emotional importance of direct access to information for older people was demonstrated in an interactive cable television information service for the elderly in Reading, Pennsylvania.[60]

Preliminary Impact Analysis

The preceding sections provide an overview of some of the current thinking regarding the likely applications and impact of videotex and teletext. This section will focus on possible consequences within the context of the categorization scheme shown in Table I. A few examples are given to demonstrate how the model might be used to assess the impact of these technologies. It is not the intent, however, to provide a complete assessment nor is it possible within the limitations of this paper.

Montgomery describes the principle behind his quality-of-life scheme as "choose that action which promises the greatest good to the greatest number (of people), under the constraint of limited resources." "Good" is defined as those goals described in Table I. It would be impossible to determine the impact on each individual member of society, so "number" is operationalized as societal sectors. Sectors are comprised of individuals with enough interests

TABLE I
Categorization of Human Needs and
Desires into Canonical Goals

	Individual (Personal)	Group (Social)
	P	E
Material (Physical)	NUTRITION Oxygen, food, drink PHYSICAL SECURITY Protection against: Nonliving agents Physical Chemical Living agents Microbiological Botanical Zoological Nonhuman Human--domestic, foreign HEALTH CARE REPRODUTION AND SEX	HEALTHFUL CHEMICAL & BIOLOGICAL AMBIENCE Atmosphere (suitable temp. & press., safe chem. comp., low organism count) Water (satisfactory temp., chemical composition, low organism count) Soil (satisfactory chem. & phys. composition & content of good and bad constituents, proper organism count) SAFE AND PLEASANT MECHANICAL AMBIENCE Low noise and vibration Stable land and climate Absence of dangerous objects Elimination of eyesores SAFE LEVELS OF RADIATION Low dangerous electromagnetic flux Low fundamental-particle flux
	F	J
Spiritual (Psychological)	RICH VARIETY OF, AND FREEDOM TO CHOOSE AMONG: Components of P and E Opportunity for self-fulfillment; in occupation, role, residence in forms of expression, assembly, religious worship, association Recreation and entertainment EMOTIONAL SECURITY Freedom from fear of deprivation in components of P, E, and J	RETRIBUTIVE JUSTICE Equal Treatment under the law DISTRIBUTIVE JUSTICE Equitable sharing of the fruits of production EQUITABLE PROVISION OF MOBILITY IN Residence, employment, education, recreation, entertainment Social and economic level DEVELOPMENT OF SOCIAL SOLIDARITY Identification & maintenance of a common conception of political rules Promotion of integrating customs, insignia, rituals, traditions Perceived equality of sacrifice

in common to be treated as identical within the relevant context. "Resources" are anything helpful in achieving human goals. These can be natural resources--the materials and attributes of the physical environment that are useful to man--and human resources--population and its distributions; strength, dexterity, endurance; intelligence, imagination, rationality, knowledge, sensitivity; resolve, integrity, altruism. "Greatest" would be determined mathematically and is beyond the scope of this paper.

Each individual (or homogeneous sector) in society has an opportunity set determined by the institutions in society. An opportunity set is defined as those lines of action existing in the society that are actually open to the individual or the sector. Where opportunity sets are restricted, could videotex or teletext do much to enhance opportunity sets, or will these technologies reduce opportunity sets for some societal sectors?

If teletext is used for retrieval of information similar to that which is currently found in newspapers, it is reasonable to assume that similar individual goals are satisfied for readers of an electronic newspaper. Because less newsprint would be needed in an electronic environment, and because no need exists for physical delivery of the product, group goals of conserving energy and trees are satisfied. At the same time, however, those people who are employed by newsprint suppliers--lumberjacks and paper-mill employees, for example--and truckers would be deprived of fulfillment in occupation (F goals) and possibly of physical needs of food, shelter, health care, and the like. Those employees involved in circulation--including the neighborhood newspaper carrier--would be similarly affected. The reduction in the demand for a hard-copy newspaper would probably have little impact on newspaper publishers and those involved in the editorial product. They will still be needed to gather, write and edit the information no matter what the delivery method is to be.

As an information system capable of retrieving a plethora of information, videotex would contribute to satisfaction of several goals. The types of information that might satisfy individual material needs (P goals) include purchase, preparation and handling of food. Videotex is particularly suited for comparative shopping. It could also be used for purchase and care of clothing; purchase and maintenance of shelter; home management; pest and weed control; routine health care; air-quality index; poison control; and market information (for farmers). There would be less energy use, less noise (because of less traffic as people do more errands from home); and improved air quality. In category F the information might include employment opportunities; reference materials; community calendar; voting information; movie reviews; soap opera updates; airline schedules; other travel information; restaurant listings and menus. The satisfaction of J goals is more subtle. The sectors that might be affected include consumers; retail and grocery store owners and their employees; mail order and catalog firms and their employees; real estate firms; and so on. Obviously, there will be some displacement of employees and retraining will be required for many of them if they are to be gainfully employed. Lower income consumers are not likely to be able to afford videotex systems, and, therefore, will not have easy access to information that might help them stretch their dollars. "One segment of society would be increasingly less able to make informed market choices compared to another."[61]

Assuming that middle and upper income consumers are the most likely to have electronic home information systems, another J goal would be affected. A characteristic of videotex and teletext systems is that they allow people to be more selective about the information they receive (an F goal). This individualization is highly desirable in a society in which we all seem to be suffering from information overload, and the prognosis is that the condition will worsen. But there might also be some impact on social solidarity. First

of all, the audience is obviously going to be highly fragmented. Commercial television, with all of its faults, has had the ability to bring us together as a nation in crisis situations. Newspapers, too, make us aware of the problems in society, and make us aware of how things are changing. It seems that some of this learning and cohesion will be lost if people are selecting only certain kinds of information. For example, an individual interested in sports scores may scan the paper on the way to that section. A headline or a photograph might catch the reader's attention. An example might be an awareness of black history month. Readers of the Detroit Free Press or the Milwaukee Journal, for instance, would observe articles related to the accomplishments of black Americans. Those same readers, particularly our sports fan, are not likely to call up stories on black history month on an electronic system. The sports fan would be able to go directly to the menu of sports stories, and punch up the sports scores. This reader, it could be argued, could be isolated from information about society that he, perhaps, ought to know about, particularly if we maintain that we are to continue to make progress toward a just and equitable society for all.

It is not likely that videotex systems would replace polling places unless the government would be willing to provide a videotex terminal in every home. Given the available resources and levels of government spending, that seems unlikely to occur. Government officials and politicians could use videotex systems to poll voters informally about issues affecting the community. It might also be possible to adopt videotex as a substitute for the absentee ballot. That certainly would be a boon for the elderly, handicappers, and parents of small children who might have some difficulty getting to polling places. But then it would be a boon only for "upscale" elderly, handicappers, and parents. The urban and rural poor, unable to afford a videotex terminal, would not be heard. As noted earlier, Congressman Coyne's constituents with home computer

terminals are able to send messages to his electronic mailbox. Though it is true that other constituents can still write letters and mail them, he will get the message much more quickly from the electronic mailbox. Because those who can afford home information systems may also be in a better position to make campaign contributions, elected officials may also pay more attention to those messages transmitted electronically. Whether we are talking about voting or merely expressing opinions on community concerns, the responses will be skewed in favor of the upscale consumer with the home information system. The lower income consumer is less likely to have his or her message heard.

If videotex is used for electronic banking, as it likely will be, upscale bank customers are also likely to reap the benefits. Banking ranks with grocery shopping as one of the tedious chores of daily living. Being able to bank from home will give the upscale consumer freedom to spend time doing other, more creative activities. Cleaner air and less noise will accrue to all members of society as a result of fewer trips to the bank. But once again we see inequitieis arising because the poor will still have to travel to the bank, if only to cash a welfare check. The long-term unemployed who are collecting unemployment benefits would be in the same position as the poor. They will still have the inconvenience and the transportation costs that will be saved by upper-income consumers who are able to bank electronically. Many large employers have direct-deposit services for their employees, and the government has direct deposit of social security checks. Retired people, living on a fixed income, many not be able to afford the new technologies and they, too, would have to travel to the bank. In addition to the bank customers, there are other societal sectors that would be affected by a "less cash" society. Bank employees such as tellers and security guards are the most obvious. If many transactions are handled electronically, there would be little cash left in the banks, and little need for armored truck companies to transport it.

Conclusion

This paper has not been "a systematic search for all discernible implications of videotex and teletext." The assessment could and should be taken much further. Despite its limitations, however, the analysis does serve to focus attention on the need to consider the consequences--how to provide the greatest good for the greatest number and how to offset some of the negative implications. At the very least, it seems, steps should be taken to ensure that these technologies do not make some people well off while making others less well off.

By their nature, videotex and teletext will have diverse impacts on different societal sectors. Teletext is likely to become a mass medium as widely available as television sets, and accessible by most people. Videotex, though, is the technology that holds the greatest promise for fulfilling a variety of human goals. Even from this cursory analysis one can conclude that those who are already advantaged are the ones who can benefit from videotex and the increased availability of information, better-ordered information and transaction services. The upscale consumer will be the one who can afford to pay. Some provision ought to be made, however, to ensure that at least a modicum of information necessary to function in society will continue to be accessible by all people. Perhaps public videotex terminals could be available in neighborhood libraries and schools.

In addition to who will have access to what kinds of information, another concern is the impact these technologies will have on jobs. As our society continues to move from an industrial based to an information and service based economy, the need for retraining many workers will continue to be critical. Great numbers of people who were previously employed in the industrial sector will never return to those kinds of jobs and more are likely to be displaced.

This is not to suggest that videotex will be responsible for great numbers of unemployed people. But the combined effect of widespread adoption of computer-based technologies with the industrial to information society shift will have a negative impact on those people who do not have the necessary skills to make the transition. Some provisions need to be made to help them acquire those skills.

Other issues have been raised here and it is hoped that decision-makers will be encouraged to consider the variety of human needs and desires so that this emerging technology can optimize the quality of life for many societal sectors.

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